



280097

**Second Five-Year Review Report  
For  
Douglas Road Landfill Superfund Site  
Mishawaka, Indiana  
St. Joseph County**


**September 2007**

**PREPARED BY:**

**United States Environmental Protection Agency  
Region 5  
Chicago, Illinois**

**Approved By:**

**Date:**

*for*   
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Richard C. Karl, Director  
Superfund Division

*9/11/07*  
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## **Executive Summary**

The remedy for the Douglas Road Landfill site in Mishawaka, Indiana, includes three components: the extension of municipal water to approximately 95 homes, the installation of a multi-layer cap, and the construction of a groundwater extraction and treatment system, including the installation of an artificial wetland treatment system for groundwater. The site achieved construction completion status with the signing of the Preliminary Closeout Report on September 19, 2000. The first five-year review was completed on September 11, 2002 and is the trigger for this five-year review.

The assessment of this five-year review found that the remedy was constructed in accordance with the requirements contained in the two Records of Decision for the site. The remedy is functioning as designed. Immediate threats have been addressed and the remedy is expected to be protective when groundwater cleanup goals are achieved through extraction and treatment.

## Five-Year Review Summary Form

<b>SITE IDENTIFICATION</b>		
Site name (from WasteLAN): Douglas Road Landfill		
U.S. EPA ID (from WasteLAN): IND980607881		
Region: 5	State: IN	City/County: Mishawaka, St Joseph
<b>SITE STATUS</b>		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Construction completion date: 09/19 /2000	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
<b>REVIEW STATUS</b>		
Lead agency: <input checked="" type="checkbox"/> U.S. EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Dion Novak		
Author title: RPM	Author affiliation: US U.S. EPA	
Review period: 01 /29 /2007 to 07 /15 /2007		
Date(s) of site inspection: 07 /12 /2007		
Type of review: <div style="text-align: right;"> <input checked="" type="checkbox"/> Post-SARA    <input type="checkbox"/> Pre-SARA    <input type="checkbox"/> NPL-Removal only  <input type="checkbox"/> Non-NPL Remedial Action Site    <input type="checkbox"/> NPL State/Tribe-lead  <input type="checkbox"/> Regional Discretion         </div>		
Review number: <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Actual RA Onsite Construction at OU # _____  <input type="checkbox"/> Construction Completion  <input type="checkbox"/> Other (specify)         </div> <div> <input type="checkbox"/> Actual RA Start at OU# _____  <input checked="" type="checkbox"/> Previous Five-Year Review Report         </div> </div>		
Triggering action date (from WasteLAN): 09 /11 /2002		
Due date (five years after triggering action date): 09 /11 /2007		

## Five-Year Review Summary Form, cont'd.

### Issues:

1. Impact of updated arsenic MCL on site remedy
2. Future O&M responsibilities for OU 2 pursuant to State Superfund Contract
3. Implementing and maintaining effective ICs are required to assure protectiveness of the remedy

### Recommendations and Follow-up Actions:

1. Analysis of impacts on protectiveness of site remedy
2. Ensure that operable unit 2 (OU 2) O&M is transferred to IDEM as previously agreed
3. Prepare IC Plan for IC Implementation and Long-Term Stewardship

### Protectiveness Statement(s):

The remedy at OU 1 currently protects human health and the environment because there is no evidence of exposure to site contaminants and the existing use is consistent with the stated objectives of the land use restrictions as a result of the construction of the multi layer landfill cap, the collection of landfill gas, and the maintenance of the site perimeter fencing and signage. However, in order for the remedy to be protective in the long-term, institutional controls need to be implemented on the property.

The remedy at OU 2 currently protects human health and the environment because there is no evidence of exposure to contaminated groundwater and the existing use is consistent with the stated objectives of the land use restrictions as a result of the construction of the groundwater extraction/wetlands treatment system. However, in order for the remedy to be protective in the long-term, institutional controls must be implemented on the property, and transfer of the site operations and maintenance to IDEM pursuant to the State Superfund Contract must be completed in 2011.

Because the remedial actions at all OUs are protective, the site is protective of human health and the environment in the short-term. Long-term protectiveness of the entire remedy requires compliance with groundwater, surface water, landfill gas, and landfill cap monitoring requirements in the site O&M plan; and the implementation and placement of appropriate institutional controls to prevent interference with the landfill cap and other remedy components and to prohibit groundwater use under the site.

Date of last Regional review of Human Exposure Indicator (from WasteLAN): 7/07

Human Exposure Survey Status (from WasteLAN): 7/07

Date of last Regional review of Groundwater Migration Indicator (from WasteLAN): 7/07

Groundwater Migration Survey Status (from WasteLAN): 7/07

Ready for Reuse Determination Status (from WasteLAN): 8/07

## I. Introduction

The purpose of this five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this five-year review report pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

*If the President selects a remedial action that results in any hazardous substances, pollutants or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with Section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 CFR Section 300.430(f) (4) (ii) states:

*If a remedial action is selected that results in hazardous substances, pollutants or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA) Region 5 conducted the five-year review of the remedy implemented at the Douglas Road Landfill (DRL) site in Mishawaka, Indiana. The Remedial Project Manager (RPM) for the site conducted this review from January 29, 2007, to July 15, 2007. This report documents the results of that review.

This is the second five-year review for the Douglas Road Landfill (DRL) site. The triggering action for this statutory review was the completion of the previous five-year review on September 11, 2002. This five-year review is required because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

## II. Site Chronology

6/10/86	Proposed for inclusion on the National Priorities List (NPL)
3/31/89	Finalized on NPL
9/89	State of Indiana and Uniroyal signed a consent decree for performance of a Remedial Investigation/Feasibility Study (RI/FS)
11/91	Uniroyal files for bankruptcy and work ceases at the site

8/94	U.S. EPA funded RI begins at the site
7/95	RI/FS completion (OU1)
7/95	Record of Decision (ROD) for operable unit (OU) 1 calling for a multi-layer cap
5/96	RI/FS completion (OU2)
5/96	ROD for OU2 calling for groundwater extraction and treatment through construction of an artificial wetland
8/94-6/96	Time critical removal action consisting of extension of city water to approximately 95 homes potentially impacted by groundwater contamination
2/95	Remedial Design start for OU 1 and OU 2
9/96	Remedial design for OU1 and OU2 approved by U.S. EPA
1996	Consent decree signed by bankruptcy trustee abandoning site
9/96	RA start date - OU 2
9/97	RA start date – OU 1
2/99	Approximately 16 acres of property acquired by United States for U.S. EPA on which the wetland remedy for OU 2 will be constructed
2/99-11/99	On-site remedy construction
5/00-6/00	Regrading and replanting of wetlands
8/00	Installation of filter strip by City of Mishawaka as part of OU2 discharge design
9/00	Preliminary Close-Out Report signed by U.S. EPA

### **III. Background**

#### ***Physical Characterization***

The DRL site is located in St Joseph County, just north of Mishawaka, Indiana. The site is approximately 32 acres in size and is located near the northwest corner of Douglas and Grape Roads. The site includes the original 16 acres in the NPL site description plus an additional 16 acres that U.S. EPA acquired to build the artificial wetland to treat contaminated groundwater. The site is bounded by the right-of-way for the Indiana State Toll Road to the north, a shopping center and an apartment complex to the east, residential properties and Douglas Road to the south, and commercial development to the west. (See Figure 1)

#### ***Land and Resource Use***

In the early 1950s, the site was excavated and gravel from the site was used for the construction of the interstate. Uniroyal Plastics leased the gravel pit and used it to dispose of plant wastes between 1954 until the plant was closed in December 1979.

The current land use for the surrounding area is residential and increasingly commercial. The first five-year review for the DRL site anticipated that these land uses would continue into the foreseeable future, with more emphasis on commercial development. This development is currently underway. The site itself is currently fenced and the landfill contents are contained under an impermeable cap within the fenced area.

## Institutional Control (IC) Review

Site Base Map

Superfund  
U.S. Environmental Protection Agency**Douglass Rd/Uniroyal Inc. Landfill**  
**St. Joseph County, IN****IND980607881****Legend** Douglass Rd/Uniroyal Inc. Landfill0 300 600  
Feet

RPM: Dion Novak

Created by Sarah Backhouse  
U.S. EPA Region 5 on 9/25/06

The groundwater near the site was used as a drinking water source in the past. Because of U.S. EPA's city water extension to area residents, those immediately adjacent to the site do not drink groundwater. The dominant groundwater flow direction is to the west/southwest towards the St. Joseph River, which is located approximately 1 ½ miles from the site.

### ***History of Contamination***

Uniroyal Plastics disposed of plant wastes at the site from 1954 to 1979. From 1954 to 1971, Uniroyal disposed of solvents, fly ash, paper, wood stock, rubber and plastic scrap at the site. Only fly ash was disposed from 1971 to 1979 when Uniroyal closed the site to avoid complying with the impending RCRA regulations.

According to company information, approximately 302,000 gallons of liquid waste were disposed at the site, including methyl ethyl ketone, acetone, tetrahydrofuran, toluene, hexane, and xylene. Historical aerial photos of the site indicate several pits containing liquids. The largest was in the central part of the site.

### ***Initial Response***

U.S. EPA proposed the site for the National Priorities List (NPL) on June 10, 1986, which was finalized on the NPL on March 31, 1989. U.S. EPA determined that the site remediation could be split into operable units to facilitate the remedy selection process and allow more time to study the groundwater contamination issues. Operable Unit (OU) 1 addressed the landfill and OU2 addressed the groundwater contamination issues.

In September 1994, the Region made the results of the RI for OU1 available to the public and potential responses were discussed for residential well contamination discovered in areas southwest of the site. It was decided that an extension of city water to 95 homes was the solution to the off-site groundwater contamination problem. The area chosen for city water included the handful of homes with contaminated water supplies as well as those in the immediate area of potential impacts from the groundwater plume.

In April 1995, the Region issued a proposed plan for OU1, thus starting the period for public comment. A public meeting was held on April 5, 1995, at which time U.S. EPA discussed the proposed remedy for OU1 and accepted public comment.

On September 13, 1995, U.S. EPA held an availability session specifically designed to assist homeowners to complete the requisite paperwork for city water hookup. U.S. EPA released its proposed plan for OU2 to the public in November 1995, and the public comment period was extended by U.S. EPA to January 25, 1996, a total of 60 days, in response to a request made during the public comment period.

U.S. EPA completed the extension of city water to affected residents in June 1996.

## ***Basis for Taking Action***

### **Contaminants**

Hazardous substances released at the site in each media include:

Soil:

- Dioxin
- PCBs
- Arsenic
- Benzo (a) pyrene
- Beryllium
- Dibenzo (a,h) anthracene
- Bis (2-ethylhexyl) phthalate
- Benzo (b) fluoranthene
- Benzo (b) anthracene
- Chromium
- Antimony
- Nickel

Groundwater:

- Arsenic
- Vinyl Chloride
- Trichloroethene
- Bis (2-ethylhexyl) phthalate
- Dibenzo (a, h) anthracene
- Indeno (1, 2, 3-c, d) pyrene
- Manganese
- Tetrahydrofuran

Exposure to contaminated soil and groundwater results in significant human health risks due to exceedances of U.S. EPA's risk management criteria for either the average or the reasonable maximum exposure scenarios. The carcinogenic risks were highest for exposures to contaminated groundwater due to high concentrations of vinyl chloride and TCE. Non-carcinogenic risks were highest for exposure to manganese concentrations in groundwater. Risks from exposure to soil were significant due to the presence of dioxin, PCBs, PAHs and bis (2-ethylhexyl) phthalates.

## **IV. Remedial Actions**

### ***Remedy Selection***

The RODs for the DRL site were signed on July 13, 1995 (OU1) and May 3, 1996 (OU2).

The remedial action objectives (RAOs) for OU1 were to remediate contaminated on-site soil and waste material. To address this RAO, the major components of the remedy for OU1 included the following:

1. Installation of a composite barrier cap with a geosynthetic clay liner (GCL) soil barrier layer, meeting the requirements of 329 IAC 2-14-19
2. Collection and disposal of landfill gas
3. Perimeter ditches to collect surface water drainage
4. Groundwater and source area monitoring (including landfill gas)

The remedial action objectives (RAOs) for OU2 were to address contaminated groundwater, both on and off-site. To address this RAO, the major components of the remedy for OU2 include the following:

1. Groundwater extraction using extraction wells or collection drains to contain groundwater in the down-gradient direction of the groundwater plume
2. Groundwater treatment through construction of an artificial wetland
3. Re-infiltration, to the maximum extent practicable, of the extracted groundwater that has undergone treatment in the constructed wetland
4. Discharge to Juday Creek of the remainder of the treated groundwater, in compliance with NPDES substantive and administrative requirements for IDEM
5. Groundwater and source area monitoring to ensure that the goals of this action are met and those down-gradient water supplies are not adversely impacted by groundwater contamination
6. Long-term operation and maintenance of the remedy to ensure protection of public health and the environment

### ***Institutional controls***

Institutional controls (ICs) are required to ensure the protectiveness of the remedy. ICs are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to assure long-term protectiveness for any areas which do not allow for unlimited use or unrestricted exposure (UU/UE).

**Table 1: Institutional Controls Summary Table**

<b>Media, Engineered Controls, &amp; Areas that Do Not Support UU/UE Based on Current Conditions.</b>	<b>IC Objective</b>	<b>Title of Institutional Control Instrument Implemented (note if planned)</b>
DRL Property – Uniroyal parcel -east half  Constructed Subtitle C landfill cap; Area also exceeds groundwater cleanup standards	Prohibit construction and any site development; prohibit groundwater use and prohibit interference with landfill cap	Restrictive Covenant (to be implemented)
DRL Property – United States parcel-west half  Constructed wetland; Area also exceeds groundwater cleanup standards	Prohibit construction and any site development and prohibit groundwater use	Restrictive Covenant (to be implemented)
Down-gradient Groundwater – Current area that slightly exceeds groundwater cleanup standards identified in Table 2.	Prohibit groundwater use until cleanup standards are achieved	No formal IC needed – standards are expected to be achieved within 2-5 years. Objectives of ICs expected to be achieved via informational IC.

Maps which depict the current conditions of the site and areas which do not allow for UU/UE will be developed as part of the implementation plan for the ICs discussed below.

Institutional controls are required for the DRL property in the form of restrictive covenants to limit the use of the site for construction or other site development and to prohibit the use of groundwater under the site for any purpose. Access restrictions are required for the site in the form of fencing to restrict site access and warning signs to state the potential hazards posed by the site. The fencing and warning signs were completed as part of the construction of the remedial action and have been consistently maintained since that time. Although not ICs, the fencing and warning signs also serve to meet IC objectives.

The National Contingency Plan (NCP) uses the term “deed restrictions” generally as a type of institutional control. The term “deed restrictions” has no clear meaning in traditional property law but is used to refer generally to proprietary controls such as restrictive covenants and easements on the property.

**Uniroyal parcel-east half:** The NPL site was owned originally by Uniroyal. This ownership continued throughout the RI/FS. Uniroyal declared bankruptcy in 1991 and remanded control of the property to a court appointed trustee. This trustee officially “abandoned” the site in 1996 via a consent decree (Stipulation and Order -Case No. 91-33364HCD) and U.S. EPA and Indiana Department of Environmental Management (IDEM) were granted perpetual site access to construct, operate and maintain the site remedy by this stipulation and order. Recent conversations with the site trustee have not revealed the current title status of the site. U.S. EPA is investigating current title ownership.

**United States property-west half:** No declaration has been filed or recorded for this portion of the site. The current owner is the United States pursuant to the property purchase from two private owners in February 1999.

Long term protectiveness at the site requires compliance with land and ground water use restrictions. Long term stewardship/ monitoring is necessary to assure compliance with the land use restrictions.

Compliance with the stated objectives of the ICs was also evaluated during the five-year review by inspections and interviews. According to inspections, there is no current use of the Subtitle C landfill. Industrial uses on adjacent parcels are not anticipated to impact the landfill. The hazardous waste landfill cap must remain in place indefinitely to prevent exposure to underlying waste. The property is currently zoned for industrial use and is being used for commercial/industrial purposes.

Initial IC evaluation activities have revealed that ICs have not been implemented. Conducting IC evaluation activities and implementing and maintaining ICs will be required to assure protectiveness of remedy. It is anticipated that an IC Plan which includes evaluating existing ICs, and planning for implementation of ICs and long-term site stewardship will be completed by U.S. EPA and IDEM. IC evaluation activities will include performing title work to verify ownership, preparing maps (paper and GIS), and determining whether prior-in-time encumbrances may interfere with the ICs.

### ***Remedy Implementation***

The remedial action took place in two phases. The first phase consisted of the extension of city water from the towns of Mishawaka and South Bend to approximately 95 homes. This action was undertaken as a time critical emergency removal action from August 1994 until completion in June 1996.

The second phase consisted of all other remedial activities. U.S. EPA determined that both OU's should be constructed simultaneously as the materials excavated from the wetlands area were used as the base in the multi-layer landfill cap. From February 1999 to November 1999, the Agency constructed the following remedy components:

- Groundwater extraction and treatment with artificial wetland system
- Clearing and grubbing of entire site
- Installation of five groundwater extraction wells
- Installation of 14 additional groundwater monitoring wells (site total of 36)
- Excavation of four wetland cells
- Rough and final grading of wetlands area
- Liner placement in wetland cells
- Earth backfill in wetland cells
- Wetlands planting with cattails and bulrush plants
- Seeding of wetlands area

Landfill cap system:

- Regrading of landfill site in preparation for capping
- Gas collection vent installation
- Installation of GCL liner and polyvinyl chloride (PVC) liner
- Excavation of surface water drainage trenches
- Placement of cap cover soils

From May 2000 to June 2000, the following activities occurred:

- Regrading of wetlands area and replanting of wetlands plants that did not survive initial 1999 planting
- Drainage trench repair and seeding of landfill cap
- Replacement of site fencing
- Installation of site access roads

In August 2000, the following activities occurred:

- Installation of filter strip by the City of Mishawaka that will convey shared discharge to Juday Creek
- Operation and maintenance of filter strip and entire storm sewer system constructed by the City of Mishawaka

The site achieved construction completion status when the Preliminary Close Out Report (PCOR) was signed on September 19, 2000.

U.S. EPA and the State have determined that all RA construction activities were performed in accordance with specifications. Off-site groundwater contaminant levels have been decreasing for some time, as is shown in the annual site data reports. On-site contaminant levels have also been decreasing but the Agency expects that cleanup to ROD groundwater standards will take many years to achieve on-site (See Table 2). After groundwater cleanup levels have been met, U.S. EPA will issue a Final Closeout Report.

### ***System Operation***

Primary activities associated with site O&M, include:

- Measuring and recording flow rate and total flow from the flow meter for each extraction well
- Inspecting, recording, and adjusting water levels for the wetland cells and infiltration basin
- Removing debris buildup and trash from influent and effluent piping, stop logs, storm water management facilities, perimeter drainage ditches, and the perimeter fence
- Inspecting the Juday Creek filter strip to ensure it is free from any obstructions
- Examining the condition of pumps
- Inspecting and characterizing wetland vegetation-replant as needed
- Inspecting the structural integrity of berms and perimeter ditches

Table 5-1 Effluent Discharge Criteria				
Parameter	Onsite Influent Conc. (µg/L)	Offsite Influent Conc. (µg/L)	Combined Influent Conc. (µg/L)	Effluent Discharge Criteria (µg/L)
CA	15.8	ND	7.9	NA
Acetone	35.9	ND	17.95	109
Isophorone	0.2	ND	0.1	50
THF	2,351.20	ND	1,175.6	25
Benzene	10.2	ND	5.1	5
4 Methyl-2-pentanone	40.6	ND	20.3	15
Toluene	93.8	ND	46.9	50
Chlorobenzene	2.8	ND	1.4	50
Ethylbenzene	20.3	ND	10.15	700
Xylenes	31.3	ND	15.65	10
1,1 DCA	0.03	ND	0.015	90
1,2 DCA	2.5	ND	1.25	5
4-Methylphenol	2.8	ND	1.4	296
BEP	5.2	ND	2.6	343.8
1,3-DCB	1	ND	0.5	NA
2-Methylphenol	0.8	ND	0.4	420
Iron	7,062.7	10.7	3,536.7	1,000
Arsenic	12.7	1.4	7.05	BG (1-5)
di-n-butylphthalate	0.8	ND	0.4	12.7
VC	ND	3.6	1.8	2
TCE	ND	8.7	4.35	5
c-1,2 DCE	ND	0.2	0.1	70
Manganese	ND	13.3	6.65	NA
Total flow = 832 gpm (wells option) or 560 gpm (drains option)				
BG = Background concentration				

- Performing regular management of berm vegetation
- Inspecting all fences, gates, and locks for integrity
- Inspecting, controlling, and removing nuisance plant and animal species
- Inspecting landfill cap integrity and mowing 1/3 of the cap vegetation yearly
- Removing deposited mineral material and sediment from piping
- Monitoring of progress of remediation by sampling 36 site monitoring wells and 5 on-site extraction wells
- Monitoring of extracted groundwater (influent) and treated effluent
- Collection of surface water, sediment, fish tissue, and invertebrate tissue samples
- Monitoring of landfill gas for methane

***Chronology of significant events following remedy construction:***

3/26/02      Signing of intergovernmental agreement between U.S. EPA and the City of Mishawaka.

9/02         Landfill gas collection system switched to active collection

9/11/02      1<sup>st</sup> five-year review completed

11/1/03      IDEM assumes operation and maintenance activities for landfill cap (OU1)

3/06         Geoprobe survey completed in off-site plume area

5/04         Extraction discontinued from Extraction well 5 (off-site extraction well)

8/06         Extraction well 2 shutdown (on-site extraction well)

8/06         Contractor switch to Sultrac

5/04         Juday Creek sampling discontinued

8/06         EXT-5 - active extraction restarted

7/07         Douglas Road widening project, agreement with City of South Bend

## **V. Progress since the Last Five-Year Review**

**Table 3: Actions Taken Since the Last Five-Year Review**

<b>Issues from Previous Review</b>	<b>Recommendations/ Follow-up Actions</b>	<b>Party Responsible</b>	<b>Milestone Date</b>	<b>Action Taken and Outcome</b>	<b>Date of Action</b>
Perimeter methane exceedances	Switch collection system to active collection	U.S. EPA	September 2002	The switch to active collection was completed in September 2002 and perimeter methane sampling conducted since the conversion confirms that methane is being controlled by the gas collection system.	September 2002

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Deed restrictions lacking on property	Pursue deed restrictions on property	U.S. EPA	March 2003	U.S. EPA is currently determining the owner of the Uniroyal property.	March 2008

## VI. Five-Year Review Process

### *Administrative Components*

The five-year review team was led by Dion Novak, RPM for the DRL site. Kevin Herron from the IDEM, Roger Shields, on-site contractor for U.S. EPA and IDEM, participated in the site visit.

This five-year review process began on January 29, 2007. This occurred as a phone conversation between the RPM and the State project manager, where the SPM was asked to prepare a summary of the State led O&M activities for the landfill cap since State takeover in 2003 and ended on July 15, 2007. The review team established the review schedule whose components included:

- Site inspection
- Document review
- Data review and summary report
- Five-year review report development and review

### *Community Involvement*

A notice was placed in the South Bend Tribune on March 23, 2007, announcing that the five-year review for the DRL site was underway, and that the results of the review and the report would be available to the public at the site repositories, at U.S. EPA Region 5 offices, and online at [www.usepa.gov/region5/superfund/fiveyear/fyr\\_index.html](http://www.usepa.gov/region5/superfund/fiveyear/fyr_index.html).

### *Document Review*

This five-year review consisted of a review of relevant site documents including

- Previous five-year review report dated September 27, 2002
- Correspondence related to ongoing operation and maintenance activities, including O&M information provided by IDEM from its work on the Uniroyal property
- Annual site summary reports
- Property title information

## ***Data Review***

### **Landfill cap maintenance-OU 1**

IDEM has performed operation and maintenance for the landfill cap since November 2003. This includes cap maintenance activities as well as quarterly monitoring of methane gas collected by the gas collection system. Issues relating to O&M since the last five-year review include: high oxygen levels in some of the gas collection wells, ponding water in the perimeter drainage ditch, rutting of the cap in two areas of the southern portion, the growth of trees in the perimeter drainage ditch, perimeter wear of the site access road, and cap settlement. A comprehensive annual cap inspection was performed in November 2003, October 2004, December 2005, and August 2006.

Gas collection well valves have been replaced, a power line to the gas collection system has been replaced, gas collection vents have been adjusted and leveled, and rutting has been repaired and regraded as part of normal O&M. Other issues identified above: ponded water and the growth of trees in the perimeter drainage ditch, wear of the site perimeter access road, and cap settlement will be addressed over the next three years as needed to maintain the cap integrity. At present, none of these issues affect the performance of the landfill cap system.

Landfill gas is continuing to be collected at the site. IDEM monitors the methane at all on-site gas vents quarterly and methane levels continue to be below detection at all monitoring locations since the system was converted to active collection in 2002. Indiana Administrative Code (IAC) 326 2-1.1-3 establishes an annual limit on VOC emissions from a treatment facility at 20,000 pounds per year. Historically, VOC emissions from the site average between 2,000 and 3,000 pounds per year and thus, a permit is not required for the site.

### **Groundwater extraction and treatment/monitoring-OU 2**

Operational issues associated with the wetlands treatment system typically revolve around algae control and the annual dredging of the infiltration basin, which is wetland cell 4. Infiltration is limited by the production of algae, which can clog the cell intake as well as the infiltration area. Introduction of wetlands vegetation has limited algae growth, but it still remains a problem for infiltration efficiency. To increase infiltration, the basin is dredged annually.

The wetland treatment system has consistently reduced influent VOC concentrations to levels below NPDES discharge criteria, which were identified in the ROD as the site cleanup standards (See Table 2). In March 2006, influent sampling to the wetland system was discontinued, as directed by U.S. EPA, due to the continuously low levels of VOCs, arsenic and lead in site sampling. During this operational year, all effluent concentrations were also below NPDES discharge criteria established for the site. This indicates that the wetland system continues to treat site groundwater successfully.

Groundwater monitoring has been conducted at the site since the start of the RI. A report is prepared annually that documents data collected and discusses groundwater trends since the onset

of system operations. Recent annual groundwater monitoring results show consistent concentrations over time from most wells, indicating that the remedy is achieving the desired results. Since the initiation of groundwater treatment at the site in 2001, total VOC concentrations from the monitoring network have decreased from 229 parts per billion (ppb) in May 2001 to 72 ppb in April 2006. These results are shown in the annual reports for the site.

Off-site geoprobe sampling in March 2006 was conducted to investigate TCE concentrations in off-site extraction well EXT-5 and to determine if conditions near the extraction well warranted its restart (it was shut down in 2004 due to decreasing off-site monitoring results). The results of this sampling indicated exceedances of TCE in the area near EXT-5, which necessitated its restart. These conditions were not unexpected and periodic geoprobe sampling will be warranted to monitor the progress of cleanup in the off-site area.

This may also require that extraction from off-site well EXT-5 be periodically stopped and restarted to effectuate complete off-site cleanup (See Table 2).

Arsenic concentrations in groundwater have fluctuated but are relatively consistent throughout the site remediation. Recent monitoring has shown a maximum detection of 18 ppb in on-site monitoring. This elevated arsenic level was probably due to suspended solids in the sample as it was unfiltered. As identified in the ROD, regional background concentrations are most likely the cause of these exceedances and will continue to be monitored.

### **Site Inspection**

The RPM and the Indiana Department of Environmental Management (IDEM) project manager conducted a site inspection on July 12, 2007. The purpose of the inspection was to assess the protectiveness of the remedy, including the presence and integrity of site fencing to restrict access, the integrity of the cap, and the condition of monitoring wells.

The inspection identified no significant issues regarding the landfill cap, the drainage structures, or the site fencing. All were intact, including signage along the length of the site fence. The cap was intact and cover vegetation remains consistent across the site.

## **VII. Technical Assessment**

### **Question A: Is the remedy functioning as intended by the decision documents?**

Yes.

The review of documents, ARARs, risk assumptions, and the results of the site inspection indicate that the remedy is functioning as intended by the RODs for the site. The stabilization and capping of contaminated soils has achieved the remedial action objectives to prevent the direct contact with or ingestion of contaminants in soil at the site.

There are no breaches to the cap and cover vegetation is uniform across the site. This cap must remain in place indefinitely to prevent any contact with waste materials. Site access is restricted at present with fencing and signage, as required by the ROD.

Compliance with ICs is required to assure that the remedy continues to function as intended. Based on inspections and interviews, there appears to be compliance with the stated objectives of the land and groundwater use restrictions.

Although the ICs have not been implemented at the site, the site is fenced and signs exist as required in the ROD, restricting site access. U.S. EPA and IDEM routinely inspect, sample, and monitor the site. To assure that the remedy continues to function as intended, effective ICs must be implemented, monitored and maintained. To that end, an IC Plan will be prepared.

**Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?**

Yes.

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The RAOs in place at the time of remedy selection remain valid. U.S. EPA will evaluate the recent reduction in the MCL for arsenic as it relates to the site groundwater ARARs.

**Changes in standards and To Be Considered**

There has been one change in ARARs at the site subsequent to the first five-year review for the site.

The MCL for arsenic has been changed from 50 ppb as outlined in the ROD to its current level of 10 ppb, which became effective in January 2006. The impacts on the long-term protectiveness of the site remedy from this change in standard needs to be fully evaluated and will be documented in the next five-year review.

**Changes in exposure pathways**

There have been no changes in exposure pathways since the ROD was signed.

**Changes in toxicity and other contaminant characteristics**

There have been no changes in contaminant characteristics during this reporting period that would impact remedy protectiveness.

### **Changes in risk assessment methods**

There have been no changes in risk assessment methods that would impact remedy protectiveness.

### **Expected progress towards meeting RAOs**

The remedy performance is progressing as expected and it is anticipated to continue to do so. Contaminant concentrations in on-site monitoring wells continue to trend downward and off-site contaminant levels are consistently decreasing as demonstrated by the groundwater monitoring performed yearly at the site.

***Question C: Has any other information come to light that could call into question the protectiveness of the remedy?***

No.

There is no other information that calls into question the protectiveness of the remedy.

### **Technical Assessment Summary**

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would impact the protectiveness of the remedy.

Contaminant concentrations in on-site monitoring wells are decreasing and off-site monitoring concentrations are also decreasing, demonstrating that the landfill cap is achieving design objectives. Recent monitoring on wetland system influent has been below discharge standards for the site and this monitoring was discontinued in 2006. System effluent concentrations have consistently been monitored as below site discharge standards, showing that the system is successfully accomplishing ROD and design objectives. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Fencing and signage were installed as part of remedy construction and are currently in place at the site and functioning as designed.

It is anticipated that restrictive covenants will be placed on both parcels that are consistent with Indiana law and satisfy the ROD requirements, to ensure protectiveness of the remedy over the long-term.

## VIII. Issues

**Table 4: Issues**

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Impact of updated arsenic MCL on site remedy	N	Y*
Future O&M responsibilities for OU 2 pursuant to State Superfund Contract	N	Y
Implementing and maintaining effective ICs are required to assure protectiveness of the remedy	N	Y

\* Results of analysis will determine any impact on long-term protectiveness

## IX. Recommendations and Follow-up actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Impact of updated arsenic MCL on site remedy	Analysis of impacts on site remedy protectiveness	U.S. EPA	IDEM	12/09	N	Y*
Future O&M responsibilities for OU 2 pursuant to State Superfund Contract	Ensure that OU 2 O&M is transferred to IDEM as previously agreed	U.S. EPA	IDEM	11/11	N	Y
Implementing and maintaining effective ICs are required to assure protectiveness of the remedy	Prepare IC Plan for IC implementation and long-term stewardship	U.S. EPA/ IDEM	U.S. EPA	9/08	N	Y**

\*If analysis shows that site remedy is no longer protective

\*\* IC plan will include planning for IC implementation on both properties and IC evaluation activities including preparation of IC maps, performing title work and planning for long-term stewardship by updating O&M plan

## **X. Protectiveness Statement**

The remedy at OU 1 currently protects human health and the environment because there is no evidence of exposure to site contaminants and the existing use is consistent with the stated objectives of the land use restrictions as a result of the construction of the multi layer landfill cap, the collection of landfill gas, and the maintenance of the site perimeter fencing and signage. However, in order for the remedy to be protective in the long-term, institutional controls need to be implemented on the property.

The remedy at OU 2 currently protects human health and the environment because there is no evidence of exposure to contaminated groundwater and the existing use is consistent with the stated objectives of the land use restrictions as a result of the construction of the groundwater extraction/wetlands treatment system. However, in order for the remedy to be protective in the long-term, institutional controls must be implemented on the property and transfer of the site O&M to IDEM pursuant to the State Superfund Contract must be completed in 2011.

Because the remedial actions at all OUs are protective, the site is protective of human health and the environment in the short-term. Long-term protectiveness of the entire remedy requires compliance with groundwater, surface water, landfill gas, and landfill cap monitoring requirements in the site O&M plan. Long-term protectiveness will likely include the placement of appropriate institutional controls to prevent interference with the landfill cap and other remedy components and to prohibit groundwater use under the site.

## **XI Next Review**

The next five-year review for the DRL site is required by September 2012, five years from the date of this review.